Name _____

Test Cross:
Working Backwards to Determine Parental Genotypes

1. We want to know if a certain tall male pea plant is homozygous or heterozygous. Therefore, it is crossed with a female short plant. This is called a test cross. The resulting phenotype ratio is 1 tall: 1 short.

Homozygous tall male _____ X

Short female ____

Genotype ratio:

Phenotype ratio:

Heterozygous tall male ____ X

Short female ____

Genotype ratio:

Phenotype ratio:

What is the tall male plant's genotype? _____

2. We want to know if a certain tall female pea plant is homozygous or heterozygous. Therefore, it is crossed with a male short plant. (Again, this is called a test cross.) This time the resulting phenotype ratio is 100% tall.

Short male _____ X

Homozygous tall female ____

Genotype ratio:

Phenotype ratio:

Short male ____ X

Heterozygous tall female ____

Genotype ratio:

Phenotype ratio:

What is the tall female plant's genotype? _____

3. Axial flower position (A) is dominant over terminal flower position (a).
   Two pea plants with axial flowers are crossed.
   The resulting phenotypic ratio is 3 axial: 1 terminal.
   What are the genotypes of the parents? Prove your answer with a Punnett square.

   Male Axial flower's genotype: _____ X Female Axial flower's genotype: _____

Genotype ratio:

Phenotype ratio:

4. Two pea plants with axial flowers are crossed.
   This time the resulting phenotypic ratio is 100% axial.
   What are the genotypes of the parents? Prove your answer with a Punnett square.

   Male Axial flower's genotype: _____ X Female Axial flower's genotype: _____

Genotype ratio:

Phenotype ratio:

Is there more than one possible answer? _____

If so, what is the other possibility? _____